

Earle s.n. [Ocean Springs] (N); Seymour & Earle 118 [Herb. Wall 5] (S); Skehan 118 (Ur), 1600 (Mi), 22587 (Ur). County undetermined: Gerhart 50 (N). LOUISIANA: Orleans Par.: Cocks s.n. [N. O., July 1899] (Tl), s.n. [N. O., July 1901] (Tl); T. Drummond s.n. [New Orleans, 1832] (S). Rapides Par.: Hale s.n. [Alexandria] (Pa). Saint Tammany Par.: Joor s.n. [Aug. 14, '88] (Tl); Langlois s.n. [14 July 1884] (I), s.n. [16.IV.1894] (I). TEXAS: Hardin Co.: M. B. Morrow s.n. [Kountze, 4.20.30] (Au); E. J. Palmer 9559 (Du-204186, S); Parks & Cory 23363 (Tr); Warner s.n. [Saratoga, April 21st] (Hu). Jasper Co.: Lundell & Lundell 10552 (Ld, N). Jefferson Co.: Hooks s.n. [Beaumont, 5-30-34] (Au). Kleberg Co.: Tracy s.n. [Kingsville, 4-10-1905] (Tr). Newton Co.: Tharp 2775 (Au), 2776 (Au), 2779 (Au). CULTIVATED: Germany: Herb. Calif. Acad. Sci. 31461 (Gg). LOCALITY OF COLLECTION UNDESIGNATED: Curtiss s.n. [Southern States, 1875; Herb. Saldanha 2762] (Ja, Ka); Herb. Martius 1470 (Br); Herb. Univ. Vermont 9592-20 (Vt); Walter s.n. (Pr); A. Wood s.n. (Pa).

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS HIEROBOTANA

Harold N. Moldenke

This is the twenty-fourth in my series of works of monographic nature on the genera of Verbenaceae, Avicenniaceae, Stilbaceae, and Sympcoremaceae. Previous genera so treated were Aegiphila Jacq., Amazonia L. f., Avicennia L., Baillonia Bocq., Bouchea Cham., Casselia Nees & Mart., Castelia Cav., Chascanum E. Mey., Citharexylum B. Juss., Cormutia Plum., Parodianthus Troncoso, Petitia Jacq., Petrea Houst., Priva Adans., Pseudocarpidium Millsp., Recordia Moldenke, Rehdera Moldenke, Rhaphithamnus Miers, Styloodon Raf., Svensonia Moldenke, Tectona L. f., Vitex Tourn., and the New World and cultivated members of Callicarpa L.

Full explanation of the abbreviations employed herein for the names of the 255 herbaria whose material was examined, in whole or in part, the preparation of these works will be found in Phytologia 5: 154-159 (1955), 6: 242 (1958), and 7: 91-92 (1959) and 123-124 & 293 (1960).

HIEROBOTANA Briq. in Engl. & Prantl, Mat. Pflanzenfam. 4 (3a): 148. 1895.

Synonymy: Hierobotana (Kunth) Briq. ex Cavillier, Candollea 6: xxxvi. 1936. Hierobotama Briq. ex Moldenke, Prelim. Alph. List Invalid Names 27, in syn. 1940. Hierobotoma Briq. ex Moldenke, Prelim. Alph. List Invalid Names 27, in syn. 1940.

Hierotoma Briq. ex Moldenke, Prelim. Alph. List Invalid Names 27, in syn. 1940. Hierobotana Engl. & Prantl ex Moldenke, Alph. List Invalid Names Suppl. 1: 10, in syn. 1947. Hierotoma Briq. ex Moldenke, Résumé Suppl. 2: 9, in syn. 1960.

Literature: H.B.K., Nov. Gen. & Sp. Pl. 2: 273, pl. 135. 1818; Spreng., Syst. Veg. 2: 749. 1825; Steud., Nom. Bot., ed. 2, 750. 1840; Walp., Repert. 4: 25. 1845; Benth., Pl. Hartweg. 245. 1846; Schau. in A. DC., Prodr. 11: 550. 1847; Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1146. 1876; Jacks., Ind. Kew. 2: 1179. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1895; Dalla Torre & Harms, Ind. Siphonog. 633 & 770. 1900; Durand & Jacks., Ind. Kew. Suppl. 1: 213. 1902; Macloskie in W. B. Scott, Rep. Princeton Univ. Exped. Patagonia 8 (2): 686. 1905; Stapf, Ind. Lond. 6: 430. 1931; Junell, Symb. Bot. Upsal. 4: 15. 1934; Cavillier, Candollea 6: xxxvi. 1936; Moldenke, Geogr. Distrib. Avicenn. 22 & 23. 1939; Moldenke, Prelim. Alph. List Invalid Names 27, 45, & 46. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 35, & 93. 1942; Moldenke, Alph. List Invalid Names 26, 46, & 48. 1942; Moldenke, Alph. List Cit. 1: 10, 50, 113, 118, 202, 262, & 325. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 30. 1948; Moldenke, Alph. List Cit. 2: 347, 409, 424, 427, 428, 491, 544, 573, 580, & 641—643 (1948), 3: 857, 871, 872, 901, 950, & 956 (1949), and 4: 979 & 1113. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 69, 72, & 186. 1949; Moldenke, Mem. N. Y. Bot. Gard. 9: 176. 1955; Moldenke, Résumé 79, 83, 298, 361, 367, 405, & 456. 1959; Moldenke, Résumé Suppl. 2: 9 & 11. 1960.

Subshrubs, strigose-hispidulous and canescent throughout; stems and branches obtusely tetragonal, procumbent or ascending; leaves decussate-opposite, exstipulate, sessile or subsessile, 3-parted, herbaceous, the divisions much-laciniate; inflorescence centripetal (racemose), terminal, spicate, eventually elongate, simple; flowers hypogynous; calyx gamosepalous, cylindric, very slightly zygomorphic or practically actinomorphic, weakly 5-ribbed, the rim equally 5-toothed; corolla gamopetalous, slightly zygomorphic, the tube included by the calyx, more or less pilose in the throat, the limb small, spreading, 5-lobed, the lobes sub-equal, rounded, somewhat emarginate at the apex, arranged in bud like those of Verbena, that is, the 2 posterior ones outermost and the anterior one innermost; fertile stamens 2, anterior, inserted in the corolla-tube, included; anthers ovate, unappendaged, with parallel thecae and elongate connective; staminodes 2, posterior, minute, or absent; pistil one; style single, short, 2-lobed at the apex; ovary 2-carpellary, plainly 4-lobed, completely 4-celled, 4-ovulate; fruiting-calyx conspicuously inflated at the base, the teeth bent together in brush-like fashion; fruit enclosed by the mature calyx, dry, schizocarpous, separating at maturity into four 1-seeded linear-oblong cocci.

This genus, as far as is now known, is monotypic, the type species being Verbena inflata H.B.K. [=Hierobotana inflata (H.B.K.) Briq.]. It is native to western South America from Ecuador

into Peru. Previous "records" from Colombia are apparently erroneous — the collections so designated were made in what is now Ecuador. The generic name is an adaptation by Briquet of "hierobotane", a pre-Linnean name applied by Brunfels and others to what is now known as Verbena officinalis L.

Junell, in the reference cited above, says "Die Gattung, welche nur diese Art von Columbien umfasst, weicht dadurch von Verbena ab, dass der Kelch bei der Fruchtreife anschwillt, und dass nur die vorderen Staubblätter fertil sind. Die Konnective der Staubblätter sind sehr lang ausgezogen, so dass man an Querschnitten von Blüten der Eindruck erhält, also ob wirklich vier Staubblätter vorhanden wären. Hinsichtlich des Fruchtknotenbaus stimmt diese Gattung mit Verbena, und zwar zufolge des Umstands, dass der Fruchtknoten deutlich vierlappig ist, am besten mit V. canadensis überein."

Dalla Torre & Harms, on page 633 of the reference given above, point out that Briquet's original publication should be dated "1895", not "1894" as it sometimes is. They list the genus as their no. 7140.8. Schauer describes the fruit rather inaccurately as a capsule.

HIEROBOTANA INFLATA (H.B.K.) Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148 [as (Kunth) Briq.]. 1895.

Synonymy: Verbena inflata H.B.K., Nov. Gen. & Sp. Pl. 2: 273. pl. 135. 1818. Verbena heterophylla Willd. ex Spreng., Syst. Veg. 2: 749, in syn. 1825. Verbena inflata Kunth apud Schau. in A. DC., Prodr. 11: 550. 1847. Hierobotana inflata (Kunth) Briq. ex Moldenke, Prelim. Alph. List Invalid Names 27, in syn. 1940. Hierobotana inflata (Kunth) Briq. ex Moldenke, Prelim. Alph. List Invalid Names 27, in syn. 1940. Verbena ceratophylla Bonpl. ex Moldenke, Prelim. Alph. List Invalid Names 45, in syn. 1940. Verbena inflata Humb. & Kunth ex Moldenke, Résumé 367, in syn. 1959. Hierotoma inflata (Kunth) Briq. ex Moldenke, Résumé Suppl. 2: 9, in syn. 1960. Verbena heteraphylla Willd. ex Moldenke, Résumé Suppl. 2: 11, in syn. 1960.

Literature: see under genus as a whole.

Illustrations: H.B.K., Nov. Gen. & Sp. Pl. 2: pl. 135. 1818.

Perennial herb or subshrub, 20–60 cm. tall, often prostrate in large clumps, forming mats, or decumbent with ascending branches, canescent and strigose-hispidulous throughout; stems very woody and heavy at the base, ramoser; branches slender, prostrate and creeping, often arranged in stellate-radiate fashion, obtusely tetragonal; internodes mostly abbreviated; leaves herbaceous, sessile or subsessile, decussate-opposite, exstipulate, light-green with a bluish cast when fresh, 3-parted almost to the base, about 2.5 cm. long, the segments narrow, the lateral ones 2- or 3-fid, the intermediate ones 3–5-fid, the ultimate divisions very narrow or linear, rather obtuse at the apex, revolute along the margins, canescent and strigose-hispidulous throughout; petioles, if present, very short and gray-hairy; inflorescence terminal, spicate, simple, sessile and oblong when

young and densely many-flowered, finally becoming more loosely flowered and fruited and subpedunculate at the base; bractlets lanceolate-subulate, shorter than the calyx; flowers pleasantly scented, with the fragrance of Heliotropium arborescens L.; calyx gamosepalous, tubular, very slightly zygomorphic or almost actinomorphic, greenish to red or reddish-brown, about 4 mm. long, equaling the corolla-tube, weakly 5-ribbed, the rim equally 5-toothed, the herbaceous ribs prolonged into 5 subequal subulate mucros from the tips of the teeth; corolla gamopetalous, slightly zygomorphic, varying from white or whitish to blue-violet, lilac, or purple, the limb small, spreading, the lobes often white with a faint flush of violet along the margins, subequal, rounded, more or less emarginate at the apex, the 2 posterior ones outermost and the anterior one innermost in prefloration, the throat more or less pilose or villous; fertile stamens 2, inserted in the throat of the corolla-tube, included, anterior; anthers ovoid, with parallel thecae, unappendaged, the connective elongate; staminodes 2, minute and posterior, or absent; ovary plainly 4-lobed, superior, 4-celled, each cell 1-ovulate; fruiting-calyx conspicuously inflated at the base, enclosing and slightly surpassing the fruit, the subulate teeth of the rim bent together in brush-like fashion; fruit dry, schizocarpous, obovate, thick, included by the mature calyx; cocci 4, linear-oblong, reticulate-wrinkled on the testa, separating at maturity.

This is the type species of the genus. The type specimen was collected by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland [Herb. Willdenow 11116] between Mucaleo, Riobamba, and Tambillo, at an altitude of 3000 meters, Ecuador, and is deposited in the Willdenow Herbarium at the Botanisches Museum in Berlin. The Bonpland specimen in the Paris herbarium has its number not plain, but is probably part of the type collection. Its label is inscribed "Verbena heterophylla" by Willdenow and "Verbena inflata mihi" by Kunth.

The species has been collected in sandy soil and in volcanic ash soil, on grassy and very dry ground, in thickets and dry meadows, on plateaus and the dry sunny plains of interandine highlands, in Stipa puna, and on dry Cangahua formations, at altitudes of 1500 to 3500 meters. Collectors have found it among scattered Croton species and herbs on open sand flats and also in Opuntia and Agave rows separating cultivated patches of land. It is said to be common in open xerophytic formations comprising plants with a short growth period, mostly cacti, shrubs and subshrubs that are green only in the rainy season, and annual herbs. It has been found in anthesis from April to February, and in fruit in January, February, April to June, August, September, and November, so it is probable that it flowers and fruits throughout the year.

Briquet states that it resembles in habit Verbena canescens H.B.K. and V. bipinnatifida Nutt., but can easily be distinguished from these North American species by its inflated fruiting-calyx and only 2 fertile stamens. Junell says that it appears to

be related to V. canadensis (L.) Britton, also of North America. Actually, the resemblance to any of these species is not very marked. It appears to me to resemble much more closely Verbena hookeriana (Covas & Schnack) Moldenke and V. crithmifolia Gill. & Hook., of Argentina, Chile, and Ecuador.

Rose & Rose 22400 was misidentified by B. L. Robinson as V. microphylla H.B.K. The Berlin sheet of Hartweg 1352 is labeled "Columbién", and the Geneva sheet is inscribed "Quito-Popayan-Bogota", but the New York and Brussels duplicates plainly indicate that the collection was made at Riobamba, near Quito, Ecuador. The Sodiro 126/18 at Berlin has an annotation saying "soll wohl 125/18 heißen." Inexplicably, Bentham (1876) calls this a Mexican species -- "V. inflata, H. B. et K., species Mexicana..."

In all, 76 herbarium specimens, including the types of all the names involved, and 4 mounted photographs have been examined.

Citations: ECUADOR: Chimborazo: André K.1549 (K, N); Asplund 5932 (S), 20464 (S); Fagerlind & Wibom 798 (S), s.n. (S); Rauh & Hirsch E.49 (Z); Rimbach 163 (B), 465 (Mi, S); Rose & Rose 22400 (G, N); Schimpff 727 (Cb, E-1080141), 746 (A, Cb, Cb, E-1087389). Cotopaxi: Weydahl 161 (S). Imbabura: André K.1547 (K, N); Asplund 20228 (S); R. Espinosa 2427 (N); Firmin 366 (N); F. C. Lehmann 6239 (B, K), K.290 (K); Stübel 130 (B), 139 (B). Pichincha: Asplund 16145 (S), 17069 (S); Bonpland 503 (P—isotype); Collector undesignated 193 (K), 228 (K); Fosberg 22537 (N, N); Hartweg 1352 (B, B, Br, Cb, K, N, P); Heilborn 512 (S); Humboldt & Bonpland s.n. [Regno Quitensi; Herb. Willdenow 11116] (B—type, F-976442—isotype, N—photo of type, Z—photo of type); Jameson s.n. [vicinity of Quito, 1831—2] (La); Moldenke & Moldenke 19786 (Mg, N, No, Ot); Spruce 5891 (Ed, G, K, K, L, N). Tunguragua: Bucher, Hjerting, & Rahn 78 (S); Camp E.2427 (N); Fosberg & Giler 22551 (N); A. S. Hitchcock 21737 (G, N, N). Province undetermined: André K.1548 [Vicente] (N); J. N. Rose 23906 [Luisa] (N); A. Sodiro 126/18 (B, B). PERU: Arequipa: Weberbauer 5749, in part (B, B, G, N, N—photo, Z—photo). Ayacucho: Weberbauer 5749, in part (E-1008707, F-628950). Department undetermined: Collector undesignated s.n. (Cb). LOCALITY OF COLLECTION UNDESIGNATED: Herb. Link s.n. [Am. mer.] (B); Herb. Sprengel s.n. (B).

MATERIALS TOWARD A MONOGRAPH OF THE GENUS DIOSTEA

Harold N. Moldenke

This is the twenty-fifth in my series of works of monographic nature on the genera of Verbenaceae, Avicenniaceae, Stilbaceae, and Sympcoremaceae. Previous genera so treated were Aegiphila